[On weights, measures and coins.] Portion of report. [Dated January 10, 1791.

(8.) The Measures, Weights and Coins of the Decimal System, estimated in those of England, now used in the United States.

1. Measures of Length.

Feet. Equivalent in English measure. The Point .001 .011 inches. Line .01 .117 Inch .1 1.174 about 1/7 more than the English inch. 11.744736 Foot 1. about 1/48 less than the English foot. .978728 feet, Decad 10. 9.787 about 1/48 less than the 10 feet rod of the carpenters. Rood 100. 97.872 about 1/16 less than the side of an English square rood. Furlong 1000. 978.728 about # more than the English furlong. Mile 10000. 9787.28 about 1 6/7 English mile, nearly the Scotch and Irish mile, and [???] the German mile.

2. Superficial Measure.

Roods. The Hundredth .01 95.79 square feet English. Tenth .1 957.9 Rood 1. 9579.085 Double Acre 10. 2.199 or say 2.2 acres English. Square Furlong 100. 22.

3. Measures of Capacity.

Bushels. Cub. Inches. The Metre .001 1.62 Demipint .01 16.2 about 1/24 less than the English half pint. Pottle .1 162.005 about # more than the English pottle. 1620.05506862 about ¼ less than the middle sized English bushel. Bushel 1. 93753106041400435? cub. feet. Quarter 10. 9.375 about # less than the English quarter. Last 100. 93.753 about 1/7 more than the English last.

4. Weights.

Pounds. Avoirdupois. Troy. The Mite .00001 .041 grains about # less than the English mite. Minim or Demigrain .0001 .4101 about # less than the half grain Troy. Carat .001 4.101 about 1/40 more than the carat Troy. Double Scruple .01 41.017 about 1/40 more than the 2 scruples Troy. Ounce .1 .937531868414884352 oz. 410.170192431 about 1/16 less than the ounce Avoirdupois. .85452 oz. 9.375 Pound 1. .712101 lb. about ¼ less than the pound Troy. .585957417759 lb. 93.753 oz. 7.121 about ¼ less than the English stone of 8 lb. Avoirdupois. Stone 10. 5.8595 lb. 937.531 oz. 71.21 about 4/10 less than the English kental of 100 lb. Avoirdupois. Kental 100. 58.5957 lb. 9375.318 oz. Hogshead 1000. 712.101 585.9574 lb.

5. Coins.

Dollars. Troy Grains. 375.98934306 pure silver. The Dollar 1. The Mill .001 34.18084937 alloy. Cent .01 Dime .1 410.17019243 Eagle 10. F

Weights & : —

POSTSCRIPT.

IT is scarcely necessary to observe, that the Measures, Weights and Coins, proposed in the preceding Report, will be derived altogether from mechanical operations; viz. A rod, vibrating seconds, divided into five equal parts, one of these subdivided, and multiplied, decimally, for every measure of length, surface and capacity, and these last filled with water, to determine the weights and coins. The arithmetical estimates in the report were intended only to give an idea of what the new measures, weights and coins would be nearly, when compared with the old. The length of the standard or second rod therefore was assumed, from that of the pendulum; and as there have been small differences in the estimates of the pendulum by different persons, that of Sir Isaac Newton was taken, the highest authority the world has yet known. But, if even he has erred, the measures, weights and coins proposed, will not be an atom the more or less. In cubing the new foot, which was estimated at .978728 of an English foot, or 11.744736 English inches, an arithmetical error of an unit happened in the fourth column of decimals, and was repeated in another line in the sixth column, so as to make the result one ten thousandth, and one millionth of a foot too much. The thousandth part of this error (about one ten millionth of a foot) consequently fell on the metre of measure, the ounce weight, and the unit of money. In the last it made a difference of about the twenty-fifth part of a grain Troy, in weight, or the ninety-third of a cent in value. As it happened, this error was on the favorable side, so that the detection of it approximates our estimate of the new unit exactly that much nearer to the old, and reduces the difference between them to 34, instead of 38 hundredths of a grain Troy; that is to say, the money unit, instead of 375.64 Troy grains of pure silver, as established heretofore, will now be 375.98934306 grains, as far as our knowledge of the length of the second pendulum enables us to judge; and the current of authorities since Sir Isaac Newton's time gives reason to believe that his estimate is more probably above than below the truth: consequently future corrections of it will bring the estimate of the new unit still nearer to the old.

The numbers in which the arithmetical error beforementioned shewed itself in the table, at the end of the Report, have been rectified, and the table reprinted.

The head of superficial measures in the last part of the Report, is thought to be not sufficiently developed. It is proposed that the rood of land, being 100 feet square (and nearly a quarter of the present acre) shall be the unit of land measure. This will naturally be divided into *tenths* and *hundredths* , the latter of which will be a square decad. Its multiples will also, of course, be *tens* , which may be called double acres, and *hundreds* which will be equal to a square furlong each. The surveyor's chain should be composed of 100 links of one foot each.

Thomas Jefferson, *Secretary of State.*

January 10, 1791.

ERRATA.

PAGE 16, *line* 33, *for* 376.02985) *read* 375.989343)

for 376.02985) *read* 375.989343)

38, *for* 376.02985 *read* 375.989343

39, *for* 371.30261 *read* 371.2626277

41, *for* 371.3 *read* 371.262

18, 3, *for* 1620.23 *read* 1620.05506862

30, *for* 376.02985 *read* 375.989343

31, *for* .38985 *read* .349343

Mairan at 39.1619 - .0113 = 39.1506 inches, almost precisely the same with Newton's computation herein adopted.

(3.) Sir Isaac Newton's computations for the different degrees of latitude from 30° to 45°, are as follows:

Pieds. Lignes. 30° 3 7.948 35 3 8.099 40 3 8.261 41 3 8.294 42° 3 8.327 43 3 8.361 44 3 8.394 45 3 8.428

(4.) or more exactly 144:175::224:272.2

(5.) or more exactly 62.5:1728::77.7:2150.39

(6.) the merchant's weight.

(7.) The English rood contains 10890 square feet = 104.355 feet square. (8.) The

(8.) The Measures, Weights and Coins of the decimal system, estimated in those of England, now used in the United States.

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